Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A mask assembly comprising:

a body having an internal surface, an external surface, and a perimeter surface; and

a forehead support connected to the body;

a support bar connected to the forehead support and extending in generally lateral directions from the forehead support to define a pair of sensor sites generally opposed said forehead support, with one of the pair of sensor sites being proximate to a FP1 standard electrode placement position of a patient and the other of the pair of sensor sites being proximate to a FP2 standard electrode placement position of said patient;

a pair of EEG sensors, with one of the pair of EEG sensors being held by the support bar at said FP1 standard electrode placement position and the other of the pair of EEG sensors being held by the support bar at said FP2 standard electrode placement position;

a control system adapted to receive a signal from said pair of EEG sensors, said control system determining said patient's sleep stage based at least in part on said signal; and

a gas delivery device in communication with said breathing mask, said gas delivery device delivering gas to the patient based on a control system determination of said patient's sleep stage.

2. (Original) The assembly of claim 1, wherein the perimeter surface includes a padding material having a thermosensitive coating.

3. (Canceled)

4. (Previously presented) The assembly of claim 1, and wherein an SPO2 sensor is located on the forehead support bar.

5. (Original) The assembly of claim 4, wherein the EEG sensor includes a pad comprised of a conductive carbonized rubber material.

6. (Original) The assembly of claim 1, and further comprising a strap extending from the mask, and wherein a physiological sensor is located on the strap.

7. (Previously presented) The assembly of claim 5, wherein a portion of the conductive material is adapted to measure EOG.

8. (Previously presented) A gas delivery system comprising:

a mask comprising a mask body having an internal surface, an external surface, and a perimeter surface;

a forehead support extending from the body and adapted to contact a forehead surface of a patient during use,

a support bar connected to the forehead support and extending in generally lateral directions from the forehead support to define a pair of sensor sites, with one of the pair of sensor sites being proximate to a FP1 standard electrode placement position of said patient and the other of the pair of sensor sites being proximate to a FP2 standard electrode placement position of said patient;

a pair of EEG sensors, with one of the pair of EEG sensors being held by the support bar at said FP1 standard electrode placement position and the other of the pair of EEG sensors being held by the support bar at said FP2 standard electrode placement position;

a gas delivery device having an adjustable gas delivery setting; and

a control system in communication with the gas delivery device and the pair of EEG sensors, the control system adapted to determine a sleep stage of the patient and to adjust a gas delivery setting based upon a determined sleep stage.

9. (Previously presented) The system of claim 8 further comprising an EMG sensor.

10. (Previously presented) The system of claim 8 further comprising an ECG sensor.

11. (Original) The system of claim 10, and further comprising a SPO2 sensor connected to the mask.

12. (Canceled)

13. (Canceled)

14. (Previously presented) A gas delivery system comprising:

a mask comprising a mask body having an internal surface, an external surface, and a perimeter surface, the mask having at least one EEG sensor connected thereto;

a forehead support extending from the body and adapted to contact a forehead surface of a patient during use;

a support bar connected to the forehead support and extending in generally lateral directions from the forehead support to define a pair of sensor sites, with one of the pair of sensor sites being proximate to a FP1 standard electrode placement position of said patient and the other of the pair of sensor sites being proximate to a FP2 standard electrode placement position of said patient;

a pair of EEG sensors, with one of the pair of EEG sensors being held by the support bar at said FP1 standard electrode placement position and the other of the pair of EEG sensors being held by the support bar at said FP2 standard electrode placement position, with leads attached to said pair of EEG sensors passing through an aperture of said support bar and along said external surface of said mask body;

a gas delivery device having an adjustable gas delivery setting; and

a control system in communication with the gas delivery device and the pair of EEG sensors, the control system adapted to determine a patient's sleep stage and to adjust the gas delivery setting based thereon.

15. (Previously presented) The system of claim 14, wherein an SPO2 sensor is connected to the mask, and wherein the control system is in communication with said SP02 sensor and said pair of EEG sensors and is adapted to derive a pulse transit time value from an output of each sensor.

16. (Previously presented) The system of claim 14, and further comprising a strap extending from the mask and a plurality of EMG sensors located on the mask and strap, the EMG sensors positioned to detect muscle activity related to sleep stage.

17. (Previously presented) A method of delivering gas comprising:

providing a mask adapted to detect an EEG signal and to deliver a gas, the mask comprising a mask body having an internal surface, an external surface, and a perimeter surface;

providing a forehead support extending from the body and adapted to contact a forehead surface of a patient during use, the forehead support having a plurality of sensors located thereon for detecting electrophysiological signals of the patient, with at least one of said plurality of sensors being a first EEG sensor positioned proximate to a FP1 standard electrode placement position of said patient and a second of said plurality of sensors being a second EEG sensor positioned proximate to a FP2 standard electrode placement position of said patient;

providing a gas delivery device in fluid communication with the mask and having an adjustable gas output;

determining a sleep stage from EEG signals detected by the mask; and

adjusting the output from the gas delivery device based on the sleep stage.

18. (Previously presented) The method of claim 17, wherein determining a sleep stage includes determining arousal.

19. (Previously presented) The method of claim 18, wherein determining arousal includes calculating pulse transit time values from an SPO2 and ECG readings.

20. (Original) The method of claim 18, wherein determining arousal includes analyzing cortical and subcortical EEG signals.

21. (Previously presented) The method of claim 18 further comprising:

attaching a light source and a light sensor on the mask so that the light source and light sensor are positioned to contact a forehead of a patient;

illuminating the light source;

detecting light from the light source as it deflects from the patient's skull; and

converting the detected light into an analog signal.

22. (Original) The method of claim 21, and further comprising the additional step of high pass filtering the analog signal.

23. (Previously presented) The method of claim 18 further comprising:

the mask also having a first thermal sensor on the internal surface and a second thermal sensor located on the external surface to be adjacent the patient's mouth, detecting a temperature change in the first or second thermal sensor.

24. (Previously presented) The system of claim 14 further comprising:

a body position sensor attached to the mask, and the control system in communication with the body position sensor and adapted to determine a body position from the body position sensor's output.

25. (Previously presented) The system of claim 24, and further comprising a movement sensor attached to the mask and in communication with the control system, and wherein the control system is also adapted to determine movement from an output of the movement sensor.

26. (Previously presented) The method of claim 17 further comprising:

providing the perimeter surface of the mask with a plurality of thermally conductive surfaces distributed throughout the perimeter surface; and

detecting a temperature change in any of the plurality of thermally conductive surfaces.

27. (Canceled)

28. (Canceled)

29. (Previously presented) The gas delivery system of claim 14 further comprising:

a movement sensor for detecting movement of the patient during use.

30. (Previously presented) The gas delivery system of claim 14 further comprising:

a mask seal leakage detector.

31. (Canceled)

32. (Canceled)